DRAFT WORK PLAN AND CONCEPTUAL DESIGN

Avery Landing Site Removal Action
Shoshone County, Idaho
TDD: 12-01-0001

REGION 10
START-3
SUPERFUND TECHNICAL ASSESSMENT & RESPONSE TEAM

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Prepared for:

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List of Abbreviations and Acronyms

µg/L	micrograms per liter
AST	above-ground storage tank
bgs	below ground surface
Bentciks	Larry and Ethel Bentcik
BMP	Best Management Practice
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
CY	cubic yard
E & E	Ecology and Environment, Inc.
EE/CA	Engineering Evaluation/Cost Analysis
EPA	U.S. Environmental Protection Agency
ERRS	Emergency and Rapid Response Services
FHWA	Federal Highway Administration
GAC	granular activated carbon
gpm	gallons per minute
IDEQ	Idaho Department of Environmental Quality
IDL	Idaho Department of Lands
IDW	investigation-derived waste
ITD	Idaho Transportation Department
LNAPL	Light Non-Aqueous Phase Liquid
OSC	On-Scene Coordinator
OWS	oil/water separator
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
Potlatch	Potlatch Land and Lumber, LLC
PVC	Polyvinyl Chloride
RAO	Removal Action Objective
Site	Avery Landing Site
START	Superfund Technical Assessment and Response Team
SVOC	semi-volatile organic compound
TCP	traffic control plan
TDD	Technical Direction Document
TMA	Transportation Management Area
TMP	Traffic Management Plan
USDA	U.S. Department of Agriculture
VOC	volatile organic compound
WZSM	Work Zone Safety and Mobility

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1 Introduction

Ecology and Environment, Inc. (E & E) has been tasked by the U.S. Environmental Protection Agency (EPA) under Superfund Technical Assessment and Response Team (START)-3 contract number EP-S7-06-02, Technical Direction Document (TDD) 12-01-0001, to provide support for a removal action at the Avery Landing Site (Site). The Site is a former railroad roundhouse and maintenance facility for the Chicago, Milwaukee, St. Paul, and Pacific Railroad, located adjacent to the St. Joe River, one mile west of the town of Avery, in Shoshone County, Idaho, as shown on Figures 1-1 and 1-2. There are four property ownership interests associated with the Site, including those of the United States, Larry and Ethel Bentcik (Bentciks), Potlatch Land and Lumber, LLC (Potlatch), and the Idaho Department of Lands (IDL). The property of the United States at the Site is administered by the Federal Highway Administration (FHWA).

Soil, groundwater, surface water, and sediment at the Avery Landing Site contain petroleum hydrocarbons and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) hazardous substances that appear to be associated with the Site's historical use as a railroad roundhouse and maintenance facility. Petroleum hydrocarbons (diesel and heavy oil) and other hazardous substances are present in subsurface soil and groundwater and are discharging into the St. Joe River. Investigations and cleanup actions have been performed by Potlatch at the Site since the late 1980s pursuant to agreements with the Idaho Department of Environmental Quality (IDEQ). Assessments and investigations were also performed at the Site by the EPA in 1992 and 2007, and by IDEQ in the late 1980s.

The removal action for the Avery Landing Site will be performed to mitigate the release of hazardous substances into the St. Joe River, and to protect human health and ecological receptors by reducing concentrations of hazardous substances to acceptable human health and ecological receptor risk-based concentrations. The planned removal action was selected from a draft Engineering Evaluation / Cost Analysis (EE/CA) prepared by START and submitted to the EPA in December 2010, and is described in the Action Memorandum for the Avery Landing Site dated July 5, 2011.

This work plan provides a preliminary approach and conceptual design for guidance during implementation of the removal action on behalf of EPA. The planned removal action will involve the removal of contaminated soil for off-Site disposal, oil recovery during excavation for off-Site treatment or recycling, removal of failed oil treatment/recovery systems, and backfill and regrading of the excavated area. This design is considered conceptual and identifies parameters to be used during construction; it will be considered final following construction under the direction of a Federal On-Scene Coordinator (OSC). All subcontractors will be contracted by the Emergency and Rapid Response Services (ERRS) contractor. General construction site guidelines will be implemented to protect the community and workers throughout the duration of the removal action activities. Best Management Practices (BMPs) will be implemented to control for potential short-term cleanup-related impacts to workers, the community, and the environment.

1.1 Site Description and Background

Until the 1970s, the Avery Landing Site was used as a railroad switching and maintenance facility for several railway lines. Activities during this time included refueling locomotives, using solvents to clean engine parts, cleaning locomotives, and maintaining equipment. Most of the railroad facilities and structures were demolished after the operations ceased at the Site; however, contamination resulting from Site activities remain on Site in subsurface soils, groundwater, and light non-aqueous phase liquid (LNAPL) based on field investigations conducted in 2007 and 2009 (E & E 2007; Golder 2009).

Presently, there is little remaining at the Site to indicate its previous use as a railroad switchyard and maintenance facility, with the exception of a concrete slab and the remnants of rail lines. The Site consists mainly of graded gravel yards and small amounts of vegetative growth over previously backfilled areas. The eastern portion of the Site currently contains a vacation cottage and mule corral on the Bentcik property which are utilized on a seasonal basis. Figure 1-3 shows the existing Site features.

Numerous groundwater monitoring wells and "stick-up pipes" (polyvinyl chloride [PVC] pipes installed vertically in subsurface soil) are also located on the Site, which were used to monitor for the presence of LNAPL in groundwater during previous investigations. Additional larger wells on Site include those used for a product recovery system, which was installed for Potlatch in 1994. Other product recovery system features that still exist at the Site include a 5,000-gallon above-ground storage tank (AST) and a shed installed on a concrete slab, which were both used by Potlatch to store recovered product from 1994–2000. Currently, the shed is used to store absorbent booms used by Potlatch to control product discharges to the St. Joe River. Near the shed, drums of investigation-derived waste (IDW) from EPA's 2007 removal assessment are staged. These investigations and recovery actions are discussed briefly below and in detail in the draft EE/CA.

1.2 Previous Site Investigations and Cleanup Activities

Several investigations and cleanup activities have been performed since the 1970s to help identify the source of contamination and reduce petroleum discharges from the Avery Landing Site that were observed to occur along the St. Joe River. Previous Site evaluations and actions are described in detail in the draft EE/CA (E & E 2010). Historical investigations performed at the Site included the collection of samples from soil, groundwater, sediment, and surface water to evaluate the presence of contaminants, including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, and polychlorinated biphenyls (PCBs) that exceed health-based screening criteria. Various cleanup actions have been initiated at the Site to prevent free product from reaching the river, including the installation of a product recovery system by Potlatch, placement of a containment barrier along the banks of the St. Joe River, and placement of booms within the river.

The continued presence of petroleum seeps and sheen in surface water at the Site indicate that the cleanup actions previously initiated have not been successful at preventing contamination from reaching the St. Joe River. Petroleum hydrocarbons have been observed in surface water, groundwater, and subsurface soil throughout the Site at levels that exceeded applicable state regulatory standards. ~~Subsurface soil and groundwater samples collected from the Site also contained several CERCLA hazardous substances (including carcinogenic polycyclic aromatic hydrocarbons [PAHs]) that exceeded applicable state and federal guidelines. Additionally, several metals (arsenic, iron, lead, manganese, and mercury) also exceeded applicable guidelines; however, some of these metals may be naturally elevated in the region.~~ Analytical results for hazardous substances show that volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), carcinogenic and non-carcinogenic polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and metals present in subsurface soil, sediment, surface water, and groundwater exceed applicable federal and/or state guidelines.

As described in the 2010 EE/CA, the scope of the proposed removal action would consist of the reduction of petroleum product and hazardous substances to acceptable human health and ecological risk-based concentrations at the Site. The removal action objectives (RAOs) developed for the Site include removing the current, non-functioning groundwater containment and extraction system installed by Potlatch; removing the bank and associated petroleum contamination; reconstruction of the bank; removal, treatment, and/or management of LNAPL and associated hazardous substances in the subsurface of the Site; and proper off-Site disposal of any waste streams generated during the removal action. To achieve the RAOs, the EE/CA identified removal action alternatives, including excavation of the contaminated soil, followed by either low-temperature thermal desorption, soil washing, or off-Site disposal of the contaminated materials. The recommended alternative for the removal action was excavation followed by off-Site disposal of LNAPL and contaminated soil. This alternative was found to be effective and implementable; it is the most straightforward and least likely problematic, and although it is not the least expensive to implement, the additional costs would be offset in part by avoiding potential cost increases due to administrative and technical feasibility concerns associated with the other alternatives.

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Figure 1-1 Site Location Map

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Figure 1-2 Site Vicinity Map

Insert 1 of 2 (11 x 17)

Figure 1-3 Site Layout Map

Insert 2 of 2 (11 x 17)

Figure 1-2 Site Layout Map

Chapter 2

2 Preliminary Approach and Conceptual Design

EPA is currently planning to conduct part of the removal action, and to have Potlatch perform the other part of the removal action under EPA oversight. The cleanup work to be undertaken by EPA will focus on properties of the United States and Bentciks, and also to some extent possibly a portion of the property of IDL. Potlatch will develop a separate work plan for properties it is responsible for cleaning up.

The preliminary approach and conceptual design for the planned removal action was developed to meet the RAOs. In general, the design for the removal action includes:

- Protect human health and ecological receptors by reducing concentrations of Site contaminants to acceptable human health and ecological receptor risk-based concentrations; and
- Mitigate the release of Site contaminants to the St. Joe River.

The following sections describe the approach for the removal action scheduled for the Site. The removal action selected involves the excavation of subsurface soil that is observed to be contaminated with petroleum contamination (diesel and heavy oils). Removal of this material is expected to eliminate the source and prevent the continued discharge of petroleum hydrocarbons and hazardous substances into the St. Joe River because the oil and contaminants are commingled and cannot be segregated~~parated~~.

Approximately 57,000 cubic yards (CY) of contaminated soil is anticipated to be excavated from the four portions of the Site and disposed of off-Site. Additionally, it is estimated that approximately 90,770 CY of clean overburden will also require excavation and will be stockpiled on Site for re-use as backfill material. Based on previous Site investigations, the excavation is anticipated to extend as deep as 20 feet below ground surface (bgs). Removal extents will be determined based on field observations (i.e., presence of free-phase petroleum hydrocarbons, oil-stained soil, visible oil sheen, petroleum odor, petroleum sheen testing, and/or field organic vapor monitoring). The effectiveness of the individual screening methods will be evaluated at the onset of the project and will undergo further evaluations throughout the removal process. Prior to backfilling excavated areas, soil samples will be collected to establish a baseline to monitor natural attenuation for any residual contamination in the Site media. Excavated areas will be backfilled using the stockpiled clean overburden and additional imported clean backfill, as necessary. The Site will be graded for natural drainage and covered with approximately 6 inches of topsoil and revegetated. Dewatering and oil recovery are anticipated to be required during excavation based on LNAPL observations made in groundwater monitoring during past investigations. Recovered oil will be transported to an off-Site treatment and/or recycling facility. Treated groundwater will be discharged into the St. Joe River and/or used for dust suppression.

The 1994 oil recovery system, the 2000 oil containment barrier, and debris such as foundations from historical Site operations, will also be removed and either reused as backfill material where practicable, or disposed of at an appropriate off-Site facility. Removal of the 2000 oil containment barrier and any other work on the bank will be limited to only those areas where the 2000 shoreline impermeable barrier is suspected to be breached. If such shoreline work is necessary, it will be performed only after mid-July and in such a manner as to avoid and minimize adverse effects on the aquatic environment. Additionally, the shoreline will be reconstructed to resemble its current configuration.

Currently, the removal action is scheduled to be performed from the ~~spring~~early summer until late fall of 2012. The details presented below and in Figure 2-1, which shows the Removal Area Layout, will be used as a basis for conducting the removal action. It is probable that upon implementation of excavation and other removal activities, actual Site conditions will result in field modifications to the presented approach.

2.1 EPA and Potlatch Cleanup Coordination

EPA is currently planning to perform part of the removal action, and to have Potlatch perform the other part of the removal action under EPA oversight. Because the cleanup work to be undertaken by EPA is located upgradient of the cleanup work to be undertaken by Potlatch, EPA will perform its cleanup first, with Potlatch beginning its cleanup after the EPA cleanup is completed. EPA will coordinate with Potlatch and its contractors to ensure an orderly Site cleanup transition and to prevent cross-contamination at the property boundaries.

2.2 Site Control and Site Access

During implementation, temporary site controls will be utilized in order to provide means for the protection of public health, safety, welfare, and the environment, and to maintain the effectiveness and integrity of the removal action. In general, these site controls will consist of fencing and other means to restrict public access to the Site that will be installed and maintained along the perimeter of the Site, including along the banks of the St. Joe River and Highway 50 that runs parallel to the Site boundaries. Signage will also be posted around the perimeter of the Site including the shore line to prohibit unauthorized entry of persons to the work areas. All activities associated with the excavation and the disposal of excavated material will be restricted to the designated working limits on Site. Staging and storage of clean construction materials or equipment (e.g., parking of personal vehicles, clean backfill/equipment, project trailer, etc.) will also be maintained on Site.

Site access will be achieved by utilizing Federal Highway Route 50 and temporary Site access roads. Traffic detouring and disruption that may result from the removal action is discussed in Section 2.5. Access roads within and outside the working limits at the Site will be maintained to allow for uninterrupted equipment/personnel access. To provide equipment access to the excavation areas from the storage/staging and laydown zones, additional temporary access roads and gravel equipment pads may be constructed for the staging of clean equipment and/or materials. Access roads will be constructed by first performing limited grading, then placing geotextile, as necessary, and gravel on graded surfaces. Actual locations of any additional temporary access roads will be determined in the field immediately prior to commencement of work, and location selection will be based on equipment limitations and access requirements.

2.3 Site Preparation

2.3.1 Utility Locate and Services

Prior to initiating work at the Site, coordination with local utility companies will occur to obtain service for the temporary on-Site facilities that will be utilized during implementation of the removal action (i.e., water-treatment facility, temporary construction trailers, etc.). In addition, utility locating agencies will be contacted in order to identify~~, protect, relocate, or abandon~~ any aboveground and/or subgrade utilities that exist at the Site that might interfere with the removal activities. ~~Active utilities located within/adjacent to the excavation areas such as the existing community sewer line will require demarcation and precautionary measures or temporary relocation for their protection. In the instance where utilities need to be relocated, interruptions of service observed by adjacent property owners and residents will be minimized to the extent possible.~~

2.3.2 Clearing and Grubbing

Throughout the removal action, activities will be restricted in an effort to preserve existing vegetation. A limited amount of clearing and grubbing will be performed to clear trees and vegetation only in specific areas that are required for the removal activities.

Clearing will consist of the felling, trimming, and cutting of trees into sections, and the reuse of the trees and other vegetation designated for removal, including downed timber, snags, and brush occurring within the support area, excavation areas, and the repository. Cleared vegetation will be cut off flush with or below the original ground surface. Cleared trees and brush will be used as erosion control slash to the extent practicable.

Grubbing will consist of the removal and reuse as erosion control slash material of stumps, roots larger than 3 inches in diameter, and matted roots from the same areas that require clearing.

2.3.3 Decommissioning of Existing Treatment System and Monitoring Wells

Monitoring wells and piezometers located within the removal area will be decommissioned in accordance with applicable rules and regulations prior to removal activities. Appropriate measures will be taken to protect monitoring wells that are located outside of the removal area during construction activities.

Once removal activities are complete, new monitoring wells will be installed at the Site. The specific number and locations of monitoring wells to be installed will be determined at the conclusion of the construction phase of the removal action, and these monitoring wells (along with any existing monitoring wells not impacted by Site activities) will be used as a part of the post-removal Site monitoring plan.

2.3.4 Previous Investigation-Derived Waste~~Drum Removal~~

The 55-gallon drums containing IDW from past EPA assessment activities will be addressed ~~removed from the Site~~ by EPA in an appropriate manner~~and will be disposed of at an appropriate off-Site facility~~.

2.3.5 Cultural Resources

~~In response to consultation with the Idaho State Historic Preservation Office, EP~~A ~~will perform a~~ pedestrian survey will be performed at the Site to identify and record any cultural resources that may be visible at the ground surface and/or observed in exposed soil profiles. The pedestrian survey will be performed at the beginning of Site removal activities.

2.4 Construction Site Layout

As part of Site preparation, access roads, clean equipment/material staging areas, decommissioning areas, and temporary facilities will be required to conduct removal activities. Access roads and staging pads will be installed by performing limited grading (as necessary), then placing geotextile (as necessary) and gravel on the graded surface. The actual locations of the temporary access roads, staging areas, equipment pads, temporary construction facilities (travel trailer, water treatment system, temporary utilities, etc.), and vehicle loading zones will be finalized in the field prior to commencement of the removal action; however, Figure 2-2 shows the preliminary construction site layout zones that have been proposed for the Site. To the extent ~~feasible and~~ practicable, temporary staging and vehicle loading areas will not be established in locations that may interfere with construction operations or necessary traffic flow. In order to construct the temporary road and provide sufficient protection for the cabin located on the Bentcik property, the cabin will be temporally relocated. Upon completion of the removal activities, the cabin will be placed back in its original location.

Commented [ETL1]: Remain vague to allow for the possibility of on-site treatment via the water treatment system and/or off-site disposal.

2.5 Road Detour and Traffic Control

Contaminated soil is present under a portion Highway 50, and as such, closing of the highway will be necessary, and traffic will be rerouted through the Site while removal work is performed on the highway (see Section 2.5). FHWA will provide the final design for replacing the portion of Highway 50 that will be removed as part the of the excavation activities.

2.5.1 Detour Road Installation During Excavation Under Highway 50

The activities to be performed at the Site will be phased in such a way that will require the construction of a temporary detour for Highway 50 while the contamination under the highway is being removed. The detour road will be a single-lane road and consist of a gravel base. Existing Site access roads will be utilized to the extent possible (see Figure 2-3 for proposed detour layout). As specified by the FHWA, signage and traffic control devices for the temporary detour road will be in accordance with the requirements of the Manual on Uniform Traffic Control Devices.

Once the excavation under Highway 50 has been completed, the highway will be rebuilt~~stored~~ according to FHWA ~~and Idaho Transportation Department (ITD)~~ specifications~~ requirements, as applicable, and the detour road will continue to provide access to removal areas for Site personnel~~. To provide for a safe work zone and allow for passage of vehicles around the worksite ~~per FHWA and state requirements~~, traffic controls will be implemented as described below.

Highway 50 is a low-traffic arterial thoroughfare; in order to accommodate larger vehicles (i.e., semi-trailers and logging trucks) that utilize this highway, the single lane detour will have a minimum width of 10 feet with 2-foot shoulders on either side. Details 1 and 2 on Figure 2-4 indicate the thicknesses of the subbase, base, and top gravel layer courses that will be required; roads should be constructed as specified in the FWHA Gravel Roads Maintenance and Design Manual (FHWA 2000). All aggregate material will meet the requirements of Section 703 of the ITD Standard Specifications for Highway Construction (ITD 2011). Tables 2-1, 2-2, and 2-3 below provide a summary of proposed gradation that is recommended for each gravel course to be applied at the Site.

Commented [ETL2]: I don't understand the fthree tables and narrative. Can't much of this discussion be reduced to but a few sentences?

Table 2-1 Proposed Gradation for Detour Road Aggregate Subbase (ITD Specification Section 703.11)

Aggregate Size	Percent Passing
4 inches	100
3 inches	90–100
No. 4	30–75
No. 2	0–13

Table 2-2 Proposed Gradation for Detour Road Aggregate Base Course (ITD Specification Section 703.04)

Aggregate Size	Percent Passing
1 inch	100
¾ inch	90–100
No. 4	40–65
No. 8	30–50
No. 30	10–25
No. 200	3–10

Table 2-3 Gradation for Detour Road Aggregate Gravel Surface Course (ITD Specification Section 703.04)

Aggregate Size	Percent Passing
¾ inch	100
No. 4	50–78
No. 8	37–67
No. 30	13–35
No. 200	4–15

A geotextile fabric will also be installed as necessary between the existing grade and the base layer to aid in proper drainage. The geotextile will be Type II and meet the requirements of Section 718.05 of the ITD Standard Specifications for Highway Construction (ITD 2011). Where existing access roads can be utilized to construct the detour road, it is assumed that the existing roadway will be sufficient to act as the subbase material; however, additional subbase material may be required along the shoulders if these access roads need to be widened. A grader will be kept on Site to maintain the detour road and the shoulders to the appropriate thicknesses and grades.

Along the eastern portion of the Site, two 12-inch, 16-gage corrugated steel culverts are proposed to be installed under the detour road in order to provide passage for runoff from an existing drainage ditch; these culverts can also be utilized to divert any dewatering water from the excavation areas into the treatment system. Culverts selected shall be able to handle vehicle loading anticipated at the Site and must meet the requirements of Section 600 of the ITD Roadway Design Manual. The ITD Roadway Design Manual indicates that the culverts need to be installed so that they are approximately 3 feet below the top of the road surface (ITD 2011). Appropriate erosion control measures will be used at the inlet and outlet ends of the pipes to maintain road slope stability.

2.5.2 Control and Regulation of Traffic

There are two aspects of traffic control at the Site: the routing of Highway 50 vehicular traffic (i.e., public traffic), and the routing of Site-related traffic.

Publicly owned and operated vehicles (i.e., those not related to Site activities) will be routed through a portion of the Site as a result of the temporary closure of Highway 50. The temporary highway detour and transportation operations (e.g., traffic management controls) will require design by a certified traffic control design specialist, and a Traffic Management Plan (TMP) will be created by a subcontractor selected by the ERRS contractor.

The movement of equipment and personnel during on-Site operations (e.g., construction equipment staging, waste and fill hauling, and Site personnel access) will be controlled by the on-Site traffic control plan (TCP) discussed herein.

Commented [ETL3]: I don't understand why we have sections 2.5.2.1 and 2.5.2.2.

2.5.2.1 Traffic Management Plan

The U.S. Department of Transportation definition of the project as either a "significant project" or a "non-significant project" defines the planning that needs to go into creating a TMP. The ITD Work Zone Safety and Mobility (WZSM) Program Manual defines a significant project as "one that, alone or in combination with other concurrent projects nearby, is anticipated to cause sustained work zone impacts that are greater than what is considered tolerable based on engineering judgment. All Interstate system projects within the boundaries of a designated Transportation Management Area (TMA) that occupy a location for more than three days with either intermittent or continuous lane closures shall be considered as significant projects." The Northern Ada County Metropolitan Planning Area is Idaho's only designated TMA; given that this project is not located in Ada County, it will be considered a non-significant project.

The ERRS subcontractor should verify that their subcontractors possess Traffic Control Design Specialist training. This training addresses the entire process for designing, installing, maintaining, and evaluating temporary traffic control in work zones and is recommended for individuals responsible for temporary traffic control design and for individuals that are responsible for designing TMPs for approval. Additional training may be necessary if nighttime traffic control, flagging operations, signs requiring supports, portable changeable message boards, arrow panels, channelizing devices, pavement markings, raised pavement markers and delineators, warning lights and floodlights, or other TO devices are anticipated for use.

2.5.2.2 On-Site Traffic Control Plan

The on-Site operations require coordination with the TMP. If TMP requirements differ from those contained within the on-Site TCP, TMP requirements shall prevail. The purpose of the on-Site TCP is to ensure that on-Site movement of equipment and material are performed in a safe manner. The details of the on-Site TCP are presented Appendix C.

2.6 Excavation

Using standard excavation equipment, excavation of the clean overburden and contaminated soils will be initiated in the upgradient portion of the LNAPL plume area and completed in the downgradient portion to reduce the potential recontamination of backfilled soils.

Commented [ETL4]: Remember to collect a limited number of grab or composite samples. Perhaps this discussion belongs in Section 2.8.

2.6.1 Field Screening

After the clean overburden is excavated, the depth of excavation will be based on visual evidence of LNAPL-contaminated soil. The extent of excavation will be determined based on field observations (i.e., presence of free-phase petroleum hydrocarbons, oil-stained soil, visible oil sheen, petroleum odor, petroleum sheen testing, and/or field organic vapor monitoring). The effectiveness of the individual screening methods will be evaluated at the onset of the project and will undergo further evaluations throughout the removal process. The procedure for conducting the petroleum sheen test will consist of collecting approximately 50 grams of representative soil at the selected locations within a glass container and applying water until the soil is saturated and water collects around it. Visual classification of the representative soils will be recorded according to the magnitude of oil sheen observed, as described below:

1) None (no sheen visually detected);
2) Sheen (oil film present, but does not display rainbow); and
3) Rainbow (definite oil sheen, film, or product that displays rainbow).

A passing test will be defined as soil that does not exhibit a rainbow sheen. If a rainbow sheen is observed in a sample, or if any of the other field screening methods (i.e., presence of free-phase petroleum hydrocarbons, oil-stained soil, visible oil sheen, petroleum odor, and/or field organic vapor monitoring) indicate the presence of petroleum, the need for additional excavation will be evaluated. R~~required and r~~e-screening will be performed until no longer determined necessary~~a passing test is achieved~~. Excavation will stop following an assessment of ~~if the soil sample passes~~ the field screening tests.

Commented [ETL5]: The point of this revision is to allow for interpretation of the field screening results. For example, what if there is still sheening but we elect not to excavate further?

2.6.2 Excavation Extent and Sequence

Excavations will extend to the bottom of the LNAPL contaminated soil or to a maximum depth of approximately 2 feet below the seasonal low groundwater level (which is an average depth of 17 feet bgs). In order to track progress associated with the excavation activities, a grid layout as shown in Figure 2-5 has been developed. Additionally, Figure 2-6 provides a typical cross-section view of how the excavation, dewatering, and backfilling operations would be performed. Based on the stability of the excavation using field observations, side slopes will be laid back to a suitable angle of repose which for the purposes of this WP is assumed to be a 3:1 slope. Excavated soils will be placed in two temporary staging areas depending on whether the soil is deemed clean or contaminated, as described in Section 2.6.1. Clean soil will be used as backfill as described in Section 2.6.6, and contaminated soil will be stockpiled, characterized, and loaded onto haul trucks and transported to an appropriately licensed disposal facility as described in Section 2.7.

Commented [ETL6]: This must be revised to reflect Jason's comments re OSHA slope requirements.

In the event that Site conditions prohibit further excavation of contaminated materials (i.e., bedrock is encountered in the side walls, depth of excavation is greater than two feet below the water table, etc.), removal activities will be halted. In such a situation and for side wall excavations, a geotextile fabric (i.e., a 40 millimeter HDPE liner or similar) shall be placed between the wall of the excavation and the clean backfill as a means of demarcation prior to backfilling. Since the liner is used to mark the location where excavation activities stop and it is not intended to act as a barrier, welding will not be required. Dependent upon the horizontal length of the side wall and the width of the liner material, it may be necessary to install multiple sheets. While welding of the liner is not required, it is necessary that a minimum 1-foot overlap of material is maintained. The liner is to be secured into the excavation side walls using manufacturer's recommended materials and installation procedures.

Commented [ETL7]: Given our discussion last week, could this paragraph be deleted?

2.6.3 Excavation Dewatering

Groundwater and stormwater have the potential to impact excavation activities. To minimize dewatering, soil below the water table will be removed during periods of low water levels (summer and fall). Initially, an estimated 100 gallon-per-minute (gpm) pump with a floating suction line will be used for dewatering operations. This will also facilitate the removal of free product. After initial free product recovery is complete, estimated 20 gpm trash pumps will be used to depress and maintain the groundwater level near the base of the excavation. To prevent LNAPL migration into deeper portions of the saturated zone that were previously uncontaminated, monitoring of the groundwater level within the open excavation will be performed to maintain a level that is not below the smear zone. The use of absorbent booms to reduce LNAPL from coming into contact with clean faces of the excavation will also be used. The dewatering system will be installed to allow continuous operation without interfering with other construction activities. Water removed by the dewatering system will require treatment, as described in Section 2.6.5, prior to discharge into the St. Joe River or re-use for dust suppression measures. Site-wide stormwater runoff will be controlled and directed away from the excavation areas to minimize infiltration, as described by the BMPs located in Appendix A.

Commented [ETL8]: Please insert a statement regarding final disposition of oiled absorbent materials in this section or Section 7 or Appendix A.

2.6.4 Excavated Soil Stockpiling and Dewatering

Depending upon the selection of disposal sites, as many as three soil staging pads may be constructed in the western portion of the Site to store excavated soil. One staging pad will be designated for clean overburden soils, and two staging pads will be designated for contaminated soils. Each staging pad will be built to stockpile approximately 5,000 CY of soil. During non-working hours (i.e., at night or on weekends), the stockpiles ~~will~~may be covered with plastic liner to protect the contaminated soil piles.

Commented [ETL9]: See App A Stockpile Management.

The staging pad for contaminated soils will be lined with a minimum of 40-millimeter thick, chemical resistant, impermeable liner with a 1 percent grade toward a collection sump. The base will be surrounded by a 2-foot-tall clay dike with 1:1 slopes. The staging pad will prevent soil contaminants from being carried off Site with contact water; wastewater collected from stockpiles will be pumped into the treatment system.

Commented [ETL10]: Is this description consistent with what we discussed while on-Site last week?

Stockpiling of the contaminated soils will allow time for sufficient dewatering of the soils to occur prior to transport to the disposal facility. Soils will be eligible for transport once visible evidence of liquid is no longer observed and a representative spoil sample passes the Paint Filter Test (EPA Method 9095). This is a relatively simple, inexpensive field test that includes suspending a conical paint filter (mesh number 60 +/- 5 percent) filled with a representative, approximate 100 gram sample from the soils pile from a tripod or ringstand for five minutes (EPA 2012). If any portion of the material passes through and drops from the filter, the material will be deemed to contain free liquids and will be returned to the spoils pile for additional handling and dewatering. Accumulated liquids from the dewatering process will be pumped into the water treatment system and treated, as described in Section 2.6.3, prior to discharge into the St. Joe River or re-use for dust suppression measures.

2.6.5 Water Treatment

Concurrent with the activities described in Sections 2.6.1 through 2.5.4, a water treatment system will be constructed. The system will be designed to collect, handle, containerize LNAPL, treat and discharge water generated during dewatering of excavated soil as well as rainfall runoff that accumulates in excavation or containment areas, water generated from equipment and personnel cleaning, and additional groundwater or surface water encountered or generated during removal activities.

As described above, removal excavations may be required to extend to a depth of approximately 2 feet below the seasonal low groundwater table (which has an average depth of 17 feet bgs) at various locations on the Site, depending on the identification of soil contamination. In order to minimize groundwater infiltration and the amount of dewatering required in the excavated areas, the majority of the removal activities are proposed to be performed during periods that would be most representative of low groundwater levels (summer/fall). Soil handling will continue in the staging areas until the spoil piles can pass the Paint Filter Liquids Test (EPA Method 9095). Liquids generated during gravity dewatering will be collected and pumped via a temporary pipeline to the treatment facility.

The temporary water treatment system design is based on anticipated influent characteristics as determined by a review of groundwater samples collected from on-Site monitoring wells during sampling events in 2007 and 2009. Based on the analytical results of the groundwater samples, the following maximum influent design parameters for the temporary water treatment system have been identified in Table 2-4.

Table 2-4 Influent Design Parameters

Design Parameter	Estimated Maximum Concentration in Groundwater (µg/L)
Benzo[a]anthracene	1.6
Benzo[a]pyrene	0.85
Benzo[b]fluorthene	0.84

Table 2-4 Influent Design Parameters

Design Parameter	Estimated Maximum
Bis(2-ethyl hexyl)phthalate	390
Chrysene	3.0
n-Nitrosodiphenylamine	12
Arsenic	88.6
Cadmium	1.07
Chromium	35.6
Copper	132
Lead	39.8
Thallium	1.4
Zinc	32000
Total PCBs	0.028

Key:
µg/L = micrograms per liter
PCB = polychlorinated biphenyl

2.6.5.1 Design Overview of Temporary Water Treatment System

The temporary water treatment system will need to treat a minimum flow of 70 gpm based on an estimate of the groundwater flow rates that are anticipated to occur at the Site (calculations provided in Appendix D). Depending upon the size of the open excavation that is at or below the water table, the amount of groundwater entering the excavation may increase. Therefore, it is proposed that the treatment system have a capacity of 250 gpm to allow for flexibility associated with excavating and backfilling procedures. Normal influent flow rates are expected to be less than the design maximum flow conditions and are likely to be highly variable (i.e., dependent on Site conditions such as precipitation events, the area where excavation activities are being conducted, the rate of surface water and groundwater infiltration, duration of dewatering activities, etc.). The temporary water treatment system will likely consist of the following components:

Influent Storage Tank: Waste water generated during the removal action will be pumped into the influent storage tank(s). The treatment system will have a minimum influent storage capacity of 100,000 gallons, which will have approximately 24 hours of storage per tank at the maximum expected flow rate. Following storage, the water will be pumped to an Oil/Water Separator (OWS).

Oil/Water Separator: The OWS will be rated for a maximum flow rate of 250 gpm. The OWS will be a gravity-type rectangular channel coalescing OWS capable of removing gross free oil and similar floatable products and will include collection chambers for settable sludge/solids recovery. The OWS will also have an adjustable oil skimming assembly that will skim floating oil into an oil collection chamber where it will gravity discharge to a 55-gallon oil storage drum. Process water that leaves the OWS will gravity-flow into a liquid-phase granular activated carbon (GAC) system.

GAC System: The design of the GAC system shall include a total of four skid-mounted GAC vessels that will each have a hydraulic capacity of 40 gpm. The system will be installed so that there are two treatment trains (primary and secondary) with only two units operating in series at any given time. Each vessel shall have the capacity to hold approximately 5,000 pounds of carbon. The GAC system shall be a gravity-flow application where water will be routed through the GAC vessels in series during normal treatment system operations. When the primary GAC vessel becomes spent (breakthrough of constituents above permitted limits are observed), a carbon change-out will occur, and at this time the secondary vessel will be moved to the primary position in order to ensure continuous treatment.

Effluent Holding Tanks: Following treatment process, water will flow into a series of 10,000 gallon effluent storage tank prior to sampling, testing, and discharge.

In addition to the main components of treatment, temporary piping, meters, transmitters, switches, and gauges will also be required. All the equipment included for the temporary treatment system will be trailer-mounted to allow for easy removal once the removal activities have been completed.

Removal activities are anticipated to only occur during one typical non-winter construction season, and the system will not need to be enclosed in a structure to protect against freezing. The temporary water treatment system will be constructed in a containment area surrounded by a berm to provide secondary containment equal to the minimum of 110 percent of one storage tank, and a one-year 24-hour storm event of approximately 1.5 inches (USDA 1963).

2.6.6 Backfill

The excavation areas will be backfilled to the original surface grade with the stockpiled clean overburden and additional suitable fill material originating from an approved off-Site ~~borrow~~ sources. The backfill sequence will be determined in the field and will depend on site conditions, available working space at the surface, and the size of the open excavation. Prior to backfilling any specific grid, soil samples will be collected from the floor and sidewalls of the excavated area, as necessary, to achieve the sampling goals discussed in Section 2.8.

Backfill material will be inspected prior to placement, and all roots, vegetation, organic matter, or other foreign debris will be removed. ~~Stones larger than 6 inches in any dimension will be removed or broken.~~ Stones will not be allowed to form clusters with voids. When backfill material is too dry for adequate compaction, water shall be added to the extent necessary. Treated effluent from the water treatment system may be used for this purpose.

Commented [ETL11]: This statement is inconsistent with what has been said regarding placement of large debris back into the excavation.

2.6.6.1 Backfill of Removal Area

The fill material used to establish rough grade for the removal area, not including the removal area associated with Highway 50, will be placed in 24-inch lifts and compacted with equipment suitable for the soil type. At least one field density test for every three lifts will be taken in accordance with ASTM D1556. Additional field density tests using ASTM D2942 (nuclear density gauge) may also be used. Excavation will be compacted to 90 percent of maximum relative density. Figure 2-6 illustrates the coordination between excavation activities, dewatering, and backfilling.

The topsoil used to establish final grade will be placed in a single loose lift of not less than 4 inches. No compaction is required for the final grade.

2.6.6.2 Reconstruction of Roadway

Backfill operations associated with the portion of the removal area within the Highway 50 right-of-way will meet FHWA construction specifications.

2.6.7 Removal Activities along St. Joe River Shoreline

As part of the removal activities at Avery Landing, portions of the shoreline may need to be excavated and reconstructed in order to address LNAPL contamination that may be observed during excavation of the upland areas of the Site that extend toward the river bank. The exact length of affected shoreline will not be known until the upland excavation work progresses; however, based on observed historic chronic free product and seep discharges to the St. Joe River, it is anticipated that disturbance of the shoreline will most likely be limited to a length of 200 to 300 feet. Shoreline reconstruction activities will occur during the seasonal low river elevation period (i.e., between July 15 to September 1, 2012) in order to minimize negative impacts on the aquatic environment. The shoreline will be reconstructed to resemble its current configuration and the removal activities will be limited to the following: excavation and off-Site disposal of observed contaminated soil ~~and shoreline features,~~ and removal and decontamination/washing and/or replacement of disturbed rip-rap. Disposition of the removed materials will be as follows:

Clean Riprap: Based on field observations, the upper 12 vertical feet of the existing riprap is free of contamination, unless observed to be otherwise. This clean riprap will be hauled to a specified on-Site area and stockpiled for later reuse.

Contaminated Riprap: It is anticipated that the lower 3 vertical feet of the existing riprap may be contaminated within a 200 to 300 foot section along the shoreline. This material will be hauled and stockpiled on a geomembrane-lined staging treatment area and will be steam-cleaned and/or pressure-washed to remove the contamination. This riprap will then be stockpiled with the clean riprap for later reuse.

Foundations: Based on historical records, it is possible that reinforced concrete foundations from former railroad structures will be encountered during soil removal along the shoreline. These foundations will be broken into manageable-sized pieces and stockpiled. If they are clean, the concrete fragments may ~~will~~ be used as backfill in excavated areas; however, the fragments will not be reused as riprap~~if possible~~. Any concrete fragments that cannot be cleaned will be handled as contaminated soil and disposed of at an appropriate off-Site facility.

Geosynthetics: Geomembrane and geotextile from previous cleanup activities will be removed and disposed of in a permitted off-Site facility.

Non-Contaminated Soils: Excavated soil along the shoreline will be evaluated in the field similarly to the methods used in the upland areas to determine whether it visually contains LNAPL. Soil containing visible LNAPL or exhibiting a sheen in groundwater will be excavated and disposed appropriately. Excavated soil not requiring treatment would be stockpiled on Site for later use as backfill.

Contaminated Soils: Excavated soils that are deemed to be contaminated will be stockpiled with the upland contaminated soils and will be disposed of off-site at an appropriate facility.

Once the contaminated soil and riprap is removed from the shoreline, the disturbed areas will be backfilled and re-graded to match the existing conditions. The slope of the new shoreline along the river will be protected from erosion by replacing the 5-foot-thick riprap layer with cleaned riprap. If additional riprap material is required, it will be obtained from an acceptable, approved off-site source and will be compatible with the existing Site riprap. ~~An Erosion and Sediment Prevention Plan will also~~ BMPs will be implemented prior to any work conducted along the shoreline to aid in bank stabilization and prevent contaminated sediment from entering the St. Joe River prior to, during, and after removal activities. ~~This Plan will utilize BMPs that will be designed, implemented, and maintained in order to fully protect and preserve the current beneficial uses of the St. Joe River.~~ The erosion and sediment control practices ~~proposed for Avery Landing~~ will meet the general conditions established under the U.S. Army Corps of Engineers Nationwide Permit 20 (Response Operations for Oil and Hazardous Substances) to ensure compliance with State of Idaho water quality standards. Bank stabilization methods that have been selected for the reconstructed shoreline within the Site boundary are discussed in Section 2.9.2.

2.7 Off-Site Disposal

During excavation, petroleum-contaminated soil will be stockpiled in 5,000 CY piles. Samples of the stockpiled soil will be collected and analyzed as necessary to meet the requirements of the disposal facility(s) (see Section 2.8.2).

2.7.1 Petroleum-Contaminated Soil

Petroleum-contaminated soil will be excavated, stockpiled for testing and dewatering, and then loaded into haul trucks for transport to an ~~CERCLA-~~ approved off-Site disposal facility.

Commented [ETL12]: Can you use consistent language. For example, sometimes the document refers to a-CERCLA approved disposal facility and other times it refers to an appropriately licensed disposal facility or an appropriate facility.

2.7.2 Recovered Free Product

Free product that is recovered during the dewatering of the excavation area will be drummed and stored on Site until completion of dewatering. The free product will undergo characteristic testing and be hauled to an appropriately licensed disposal or recycling facility.

2.8 Sampling and Testing Program

The site-specific sampling plan for analytical testing is provided in Appendix B.

2.8.1 Excavation Area Sampling

Prior to backfilling, soil samples will be collected to document conditions along the lateral and vertical extents of the final excavation areas. Limited sampling and laboratory analysis will be conducted to confirm that the field screening method (Section 2.6.1) is an adequate method for determining the limits of excavation and presence of hydrocarbons, and to document post-removal conditions as a baseline for monitored natural attenuation. Prior to backfilling, samples will be collected from the sidewalls and floor of the excavation area once the extent has been reached~~ and field screening indicates that the continued presence of contamination is unlikely~~.

Commented [ETL13]: This may not be the case; we may simply have to stop for many and varied reasons.

A sampling grid will be established prior to excavation for the floor and sidewalls. A~~It is recommended that a~~t a minimum, one confirmation sample will be obtained along a grid with intervals consisting of 150 feet (along plume length) by 100 feet (along plume width), as shown on Figure 2-5, which will amount to a total of 18 samples for the estimated plume extent. For the excavation sidewalls, one soil sample will be collected every 300 horizontal feet, at a depth either similar to the documented presence of Site contaminants or at the approximate midpoint between the base of the excavation and the ground surface. One background sample will also be collected outside the estimated plume extent to provide a baseline. Samples shall be a direct grab sample, or, depending on stability of the excavation and access to the selected sample location, may be collected from the bucket of the backhoe performing the excavation. Samples will be collected at a depth of approximately 2 to 6 inches into the exposed surface and containerized as specified by the laboratory with the sample location, date, time, and depth documented. Additional details about sampling and analytical testing are included in Appendix B.

2.8.2 Soil Disposal Characterization Sampling

During excavation, soil will be stockpiled in 5,000 CY piles and will be sampled and analyzed as required by the disposal facility(s).

2.8.3 Water Treatment Confirmation Sampling

2.8.3.1 Testing and Startup Activities

Once the water treatment system is constructed, shakedown and startup activities will be performed to determine if the system is operational, including initial testing. The general startup testing of the temporary water treatment system shall consist of treating a minimum of 50,000 gallons of water collected from the first proposed excavation area. During the startup test, the water treatment system will be operated at the maximum capacity, 250 gpm, until the entire 50,000 gallon batch has been treated. During this time, continuous flow monitoring and pressure readings (collected every 30 minutes at a minimum) shall be recorded from all of the gauges and flow meters, as necessary, in order to demonstrate that the system is operating properly prior to discharging into the St. Joe River. Adjustments will be made to the system as necessary in order to maintain a continuous flow rate of approximately 70 gpm while meeting the operating requirements for each system component. If the water is not suitable for discharge, the water will be recycled to the influent tank and retreated. Startup water samples will be collected at the influent and effluent locations and analyzed under the methods in accordance with Table 2-5.

Table 2-5 Effluent Confirmation Sampling Plan Summary

Parameter	EPA Method Number	Sample Location
Total Polychlorinated Biphenyls (PCBs)	SW-846 Method 8082	Influent/Effluent
Semi-Volatile Organic Compounds (SVOCs) (specific compounds; see Table 2-6)	SW-846 Method 8270	Influent/Effluent
Metals (specific compounds; see Table 2-6)	SW-846 Method 6000 Series	Influent/Effluent

Samples shall be collected multiple times during the startup activities when the system treats approximately 5,000 gallons, 20,000 gallons, and 45,000 gallons. The entire 50,000 gallons of treated water shall be retained in the effluent storage tanks until the analytical results indicate that the treated groundwater meets the discharge requirements. Samples collected during startup and during operational monitoring will be submitted for laboratory testing based on the parameter list presented below. Samples will be grab samples collected both prior to and after treatment to assess the efficiency of the temporary system. Effluent requirements, including allowable concentrations and sampling frequencies, are provided in Table 2-6. The temporary water treatment system is designed to meet the Surface Water Quality Criteria as Specified in The Idaho Administrative Code (2011).

Table 2-6 Effluent Discharge Limits for Avery Landing

Analytes	Discharge Limit (µg/L)(1)	Limit Type Based on Monthly Sample	Sample Type
Benzo[a]anthracene	0.0038	Daily Maximum	Grab
Benzo[a]pyrene	0.0038	Daily Maximum	Grab
Benzo[b]fluorthene	0.0038	Daily Maximum	Grab
Bis(2-ethyl hexyl)phthalate	1.2	Daily Maximum	Grab
Chrysene	0.0038	Daily Maximum	Grab
n-Nitrosodiphenylamine	3.3	Daily Maximum	Grab
Arsenic	10	Daily Maximum	Grab
Cadmium	0.6	Daily Maximum	Grab
Chromium	11	Daily Maximum	Grab
Copper	11	Daily Maximum	Grab
Lead	2.5	Daily Maximum	Grab

Table 2-6 Effluent Discharge Limits for Avery Landing

Analytes	Discharge Limit (µg/L)(1)	Limit Type Based on Monthly Sample	Sample Type
Thallium	0.24	Daily Maximum	Grab
Zinc	120	Daily Maximum	Grab
Total PCBs	0.000064	Daily Maximum	Grab

(1) Or lowest obtainable analytical detection level.

Key:
µg/L = micrograms per liter
PCB = polychlorinated biphenyl

2.8.3.2 Operational Testing

Samples from the treatment facility will also be collected on a weekly basis during normal operation of the system to monitor the discharge concentrations. Samples will be collected at the influent and effluent sampling points and tested for the parameters listed in Table 2-5 to ensure the system is meeting the discharge limits presented in Table 2-6. If discharge limits are exceeded, the system will be shut down and be adjusted as necessary. ~~Exceedances will be recorded and reported as required.~~

2.9 Site Stabilization

Following excavation of contaminated soil, the Site will be backfilled using stockpiled clean overburden and imported clean backfill. To the extent practicable, the Site will be regraded to minimize the need for imported backfill material. The regraded area, and all areas disturbed during construction, will be covered with a minimum of 6 inches of topsoil and seeded.

2.9.1 Seeding and Planting

Preservation of existing vegetation will be achieved to the extent possible; however, revegetation of the Site will be required for those areas impacted by removal activities including excavation, soil/equipment staging, and the installation of access roads. Seeds and plants provided will consist of U.S. Department of Agriculture (USDA) or other local agency-recommended (i.e., U.S. Forest Service or FHWA) native seed mixtures for the area and will be obtained from a commercial source. This seed mixture will be applied using a broadcast method. Seed will be spread on firm soil with a roughened surface. Any areas compacted with vehicle traffic will be disked or roughened prior to seed application. ~~Exposed areas steeper than 3H:1V will require placement of coir matting to minimize erosion.~~

2.9.2 St. Joe River Shoreline

~~Reconstruction of the shoreline will occur after excavation activities are completed and the impermeable oil containment barrier has been removed from the Site where appropriate.~~ Limited removal excavation is anticipated to occur only along the shoreline or within the water course that is visually impacted by petroleum contamination. Therefore, reconstruction along the St. Joe riverbanks will be minimal and should be limited to removal and decontamination and/or replacement of disturbed rip-rap, ~~removal of the existing pier,~~ and removal of large debris observed along the Site boundary.

Commented [ETL14]: Provided deletion is consistent with what we said in the BA, let's leave removal as an option dependent on what we observe at the Site..

In addition to seeding of the entire area disturbed during construction, USDA- or other local agency-recommended native plantings will be established, and mulch will be placed, along the bank of the St. Joe River, upgradient of the existing riprap. Depending upon the extent and location of the possible restoration activities, a field determination will be made associated with erosion stabilization of the shore bank. Moisture accumulation points, shade cover, and eventual habitat for wildlife will be considered in determining in re-establishing the area.

2.9.3 Monitoring Wells

As described in Section 2.3.3, ~~E~~existing monitoring wells outside the areas of excavation will be protected as practicable~~much as possible~~, and monitoring wells inside the areas of excavation will be decommissioned. Following backfill, new monitoring wells will be installed for use as part of the long-term monitoring plan for the Site.

2.10 General Construction Site Guidelines

BMPs will be employed throughout construction for control of erosion, stormwater, and fugitive dust, and to avoid adverse impacts on wildlife and their habitats. The BMPs to be implemented during this removal action are based on the Catalog of Stormwater Best Management Practices for Idaho Cities and Counties (IDEQ 2005), the U.S. Army Corps of Engineers Nationwide Permit 20, and professional experience. Appendix A includes the General Construction BMP Plan, which summarizes the BMPs that have been selected for use at the Site.

2.11 Site Monitoring and Inspections

2.11.1 BMP Monitoring and Inspections

The objective of BMP monitoring and inspections is to protect the community, workers, and the environment throughout the duration of the removal action. The ~~OSC, ERRS, and START w~~ill inspect the Site daily to assess proper mitigation efforts and to ensure that BMPs are in place to achieve this objective.

2.11.2 Air Monitoring

Perimeter air quality will be monitored regularly during construction activities to assess the impact of Site work on the community, workers, and the surrounding environment. DataRAM monitors will be utilized to measure particulate matter (particles less than 10 microns) in the air. The real-time monitors will be placed upwind (background) and downwind of Site activity to determine and record perimeter background and impacted conditions.

2.11.3 Surface Water Quality Monitoring

Surface water quality will be monitored regularly during construction activities. The construction data will be compared to historical data for the St. Joe in the vicinity of the Avery site to assess the impact of Site work on the St. Joe River.

The construction monitoring samples will be analyzed for the following parameters:

- pH, electrical conductivity, turbidity, dissolved oxygen, and temperature (using field-portable water quality instrument where possible).

Monitoring will be conducted during construction to identify any water quality problems that may be occurring as a result of construction activities, and to demonstrate compliance with legal and other monitoring requirements, including the water quality criteria and/or targets for the project. Monitoring sample sites will be upstream and downstream of the Site. Water sampling will be complemented by visual inspection of Site conditions. If a water quality problem is indicated from the monitoring results, the results will be used to assist in identification and management of the problem.

2.12 Project Schedule

Contractors will mobilize to the Site in early to mid-May 2012 to begin Site setup. During this setup time, BMPs will be put into place, the Site will be generally prepared for work, and temporary worker lodging will be established. Removal activities will begin early late May or early June 2012 and finish in late September 2012. A proposed schedule follows:

Contractors begin to mobilize and prepare the Site:	~~Mid~~ LateMay 2012
Removal activities begin:	~~Late May~~Mid-June 2012
Removal activities are completed:	Early August 2012
Contractors demobilize from Site:	Mid-~~Late~~ September 2012
Final analytical data is received from laboratory:	Mid-October 2012
Draft removal action report submitted to EPA~~the OSC~~:	Mid-December 2012
Comments are received on draft report:	Early January 2012
Final removal action report is submitted to EPA~~the OSC~~:	Mid-January 2012

As appropriate, ~~Throughout the removal action and especially at the conclusion of cleanup activities and beginning of demobilization,~~ EPA will coordinate ~~work closely~~ with Potlatch and its contractors regarding Site activities~~to ensure a smooth and timely transition~~.

2.13 Roles and Responsibilities

The Avery Landing Site removal action will be performed by EPA and its contractors. Specific details about the groups who will perform the removal action and their responsibilities are provided below.

EPA: The removal action will be managed by the EPA OSC.

ERRS: Environmental Quality Management, Inc., as ERRS contractor to EPA Region 10, will be the cleanup contractor for the removal action. Their primary responsibilities will be to mobilize the personnel, equipment, and supplies necessary to implement the removal action.

START: E & E, under an EPA Region 10 START contract, will provide on-Site technical assistance and engineering support. START will be responsible for field-screening, collecting analytical samples, and documenting the removal action.

Table 2-7 provides a list of specific duties for the removal action and identifies the group that will be responsible for those duties.

Table 2-7 Summary of Roles and Responsibilities

Task	Group Responsible
Overall management of the removal action	EPA
Implement removal action	ERRS
Improve and maintain access roads during the removal action	ERRS
Implement BMPs	ERRS
Implement Spill Contingency Plan	ERRS
Monitor BMPs	EPA, ERRS, and START
Health and Safety	Each group is responsible for H&S for its own employees
Air monitoring	START
Analytical sampling (excavation or characterization)	START
Field-screening	START
Ship samples to an off-Site laboratory	START
Document Site conditions and methods and results of removal action	START

Key:
BMP = Best Management Practice
EPA = U.S. Environmental Protection Agency Federal On-Scene Coordinator
ERRS = Emergency and Rapid Response Services
H&S = Health and Safety
START = Superfund Technical Assessment and Response Team

Insert 1 of 2 (11 x 17)

Figure 2-1 Removal Area Layout

Insert 2 of 2 (11 x 17)

Figure 2-1 Removal Area Layout

Insert 1 of 2 (11 x 17)

Figure 2-2 Construction Layout

Insert 2 of 2 (11 x 17)

Figure 2-2 Construction Layout

Insert 1 of 2 (11 x 7)

Figure 2-3 Proposed Temporary Detour Road

Insert 2 of 2 (11 x 7)

Figure 2-3 Proposed Temporary Detour Road

Insert 1 of 2 (11 x 17)

Figure 2-4 Temporary Detour Road Details

Insert 2 of 2 (11 x 17)

Figure 2-4 Temporary Detour Road Details

Insert 1 of 2 (11 x 17)

Figure 2-5 Confirmation Sampling Grid

Insert 2 of 2 (11 x 17)

Figure 2-5 Confirmation Sampling Grid

Insert 1 of 1 (8.5 x 11)

Figure 2-6 Cross Sectional View of Typical Excavation and Backfill Activities

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A General Construction BMP Plan

Erosion and Sediment Control

Erosion and sediment control ~~Best Management Practices (~~BMPs~~)~~ will be installed before construction begins. During construction activities, it will be necessary to control erosion and sediment and manage stormwater to minimize ~~erosion and introduction of sediments to the~~construction-related impacts to the St. Joe River. Efforts to achieve this may include the use of silt fence, biofilter bags, fiber rolls, vegetative buffer strips, and/or mulch. ~~Sedimentation traps will be installed to filter stormwater runoff before it exits the Site.~~ Whenever possible, sediment-laden non-contaminated water will be dispersed onto relatively level, vegetated areas to allow for infiltration. Throughout the removal action, activities will be restricted in an effort to preserve existing vegetation, and construction activities will be phased to limit the amount of exposed disturbed soil at any given time. Following construction, all disturbed areas other than existing access roads will be seeded and mulched in a manner appropriate for the area.

Soil Stabilization for Slopes and Disturbed Areas

~~Coir matting or another equally effective stabilization technique will be implemented on permanent slopes of exposed soil greater than 3H:1V~~. Following construction, all disturbed areas other than existing access roads will be seeded and mulched in a manner appropriate for the area.

Commented [ETL15]: I don't believe we need this given we should not have exposed soil greater than 3H:1V.

Stabilization of Construction Entrance/Exit

A stabilized construction exit will be installed at the exit from the Site onto Highway 50. The stabilized exit will consist of a pad of crushed rock or stone to limit sediment tracking onto the road from vehicles and heavy equipment leaving the Site. Any excess material inadvertently tracked onto Highway 50 will be promptly removed.

Stockpile Management

Stockpile management procedures and practices are designed to reduce or eliminate air and stormwater pollution from stockpiles of soil or other construction materials. Soil stockpiles may be temporarily covered with plastic sheeting during non-operational periods at the Site (i.e., nights and weekends). Stockpiles will be located away from concentrated flows of stormwater, drainages, and inlets. Stockpiles will be protected from stormwater runoff using a temporary perimeter sediment barrier such as berms, dikes, silt fences, fiber rolls, sandbags, or gravel bags. Wind erosion control practices will be implemented as appropriate on all stockpiled material. Bagged materials will be placed on pallets and under cover.

Vehicle/Equipment Washing and Maintenance

A vehicle/equipment washing and maintenance system will be installed at the Site. The system will consist of a lined, depressed area to collect heavy equipment wash water, and drain the wastewater into a collection or treatment system. The vehicle/equipment washing and maintenance system will limit the transport of sediment and contaminants off Site.

Commented [ETL16]: Not clear why this section is included. Doesn't the construction entrance/exit accomplish the same objective?

Spill Contingency Plan

The following Spill Contingency Plan will be implemented to minimize fuel spills and/or to respond immediately in the event that a fuel spill does occur:

- On-Site fuel storage tanks will be placed in a location away from receiving waters and will be surrounded by berms or dikes as secondary containment.
- Drip pans will be used to contain small volumes of leaks, drips, and spills.
- Refueling or machinery maintenance will be conducted at a safe distance from receiving waters.
- Motorized equipment or fuel/oil storage used on Site will be inspected regularly for leaks or impending failure. This inspection will include, but is not limited to, checking fuel hoses, oil drums, oil or transfer valves and fittings.
- An emergency spill response and containment kits containing sorbent boom will be located on Site.
- Each vehicle used on Site will be equipped with a bucket and shovel for use in spill recovery.
- Spilled material and used cleanup materials will be disposed of at an approved disposal facility.

Dust Control

Air quality will be monitored and maintained during construction activities (see Section 2.11.2). Appropriate measures will be taken to prevent dust generation and to monitor work space and perimeter air quality during removal action activities. These BMPs provide increased worker safety and reduce migration of contaminated dusts into surface waters or nearby wildlife habitat.

Dust control measures such as sprinkling or mulching will be implemented on open dry areas of soil, as necessary, and prior to clearing or excavation activities. A water truck will be kept on Site to provide water, which will be sprinkled on the surface of haul roads and other traffic routes to reduce dust levels. Effluent water from the treatment facility can be used for dust suppression as needed. Where appropriate and feasible, mulch or other materials will be used as a longer lasting means of dust control.

Waste Management

A dumpster will be kept on Site for inert construction debris and non-hazardous solid waste. These wastes will be transported off-Site for disposal following construction.

Construction Noise Control

In order to reduce the impact of construction-related noise, removal activities will be performed from 7 a.m. to 6 p.m. Equipment will be maintained in proper working order and equipped with standard noise reduction devices to minimize construction-related noises.

Security

A security guard will be present at the Site full-time whenever construction is not in progress.

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Chapter B

B Site-Specific Sampling Plan

Chapter C

C On-Site Traffic Control Plan

~~The Emergency and Rapid Response Services (ERRS) Contractor will prepare a detailed~~An on-Site traffic control plan (TCP) will be prepared. The TCP will name the individual employee who has overall traffic control responsibilities. The TCP will also include drawings for each separate case where traffic flow will be interrupted or altered showing all traffic control devices. The TCP will~~should~~ work in conjunction with the Traffic Management Plan (TMP) prepared in accordance with Federal Highway Administration~~ and Idaho Transportation Department~~ guidelines. It is the intent to require the Contractor to maintain excellent safety conditions for his workers, the public (drivers and pedestrians), and all vehicles.

Anticipated interference with traffic includes:

1. Placing, removing, and maintaining traffic control devices.
2. Traffic entering and leaving the support or construction areas. This includes trucks making deliveries and equipment being loaded and unloaded.
3. Relocating personnel, materials, or equipment from one side of Highway 50 to another.
4. Connection to or protection of utilities located near the highway.
5. Surveying of the roadway.

Within the safety requirements, the intent is to minimize inconvenience to the public. Additionally, emergency vehicles shall be given the right-of-way in all situations.

In conditions where hazardous conditions created by the Contractor’s operation are not controlled by traffic control standards or designs, work should stop until the activity has been made a part of the TCP.

Traffic Control Devices

Products specified within this appendix will be removed from the property when no longer needed. Items such as safety vests, flags or signs for flagmen, and communication devices should be standard and adequate for the intended function. ANSI/ASSE A10.47-2009: Work Zone Safety for Highway Construction Standard will be adhered to.

Maintenance

Any traffic control barrier that has become ineffective due to damage or defacement will be replaced. All traffic control devices will be kept clean and neat. Barricades and/or cones used for channelization or delineation and warning signs should be sequentially placed in the direction of the traffic flow and removed in reverse order. Temporary traffic control devices will remain in place only as long as they are needed and will be removed as soon as practical.

~~Personnel~~

~~The ERRS contractor will furnish the name of the individual in his direct employ who is to be responsible for the installation and maintenance of traffic control for the project. If the actual installation and maintenance are to be accomplished by a subcontractor, it will not relieve the ERRS contractor of the requirement for a responsible individual in his direct employ.~~

Operations

When a section of the road is closed for construction activities, such as moving personnel, materials, or equipment from one side of Highway 50 to another, traffic shall be stopped in both directions for safe passage. The ERRS contractor will protect workers and the public by furnishing, erecting, and maintaining signs, markers, barricades, warning lights, flaggers, and other traffic control devices or personnel for the type of operation being performed. The number, size, color, size, and placement of all traffic control devices should conform to the TCP and the Manual on Uniform Traffic Control Devices.

All vehicles and/or non-operating equipment parked for two hours or less during working hours will be 8 feet from the moving traffic lane. During non-working hours, all materials and equipment shall be stored a minimum of 30 feet from the pavement, or behind man-made or natural barriers when such barriers are adjacent to the traffic lane of the work area. Stored materials or equipment within 15 feet of any roadway is prohibited.

Whenever trucks or other equipment turn off a public street, the ERRS contractor shall ensure that the trucks or equipment do not stop and block or otherwise protrude into the shoulder or lane of traffic. Provide flaggers whenever turning of trucks or other equipment is occurring.

Except in special circumstances, personnel will not cross the roadway on foot. Crossing should be performed in vehicles only. All vehicles and equipment operating on public streets, other than equipment crossings, shall be licensed.

Chapter D

D Groundwater Calculations

DRAFT TECHNICAL MEMORANDUM

Date: January 25, 2012

Subject: Groundwater Flow Rate Estimate for Dewatering

This memorandum provides estimates of the flow rates and volume of groundwater that are anticipated to result from dewatering activities within excavation areas at the Avery Landing Site (Site). Any water collected at the Site will be assumed to be contaminated and will require treatment prior to disposal. It is necessary to calculate the groundwater rates in order to properly design the treatment system to ensure that it has adequate capacity to process wastewater continuously. Currently, limited information has been obtained about the local and regional hydrogeology of the Site and many assumptions were used to develop these estimates, which have been recorded thusly.

The first major assumption about Site hydraulics is that the groundwater is sourced by a steady-state, unconfined aquifer; therefore, the flow calculations for dewatering are dictated by the Thiem equation:

$$Q = \frac{\pi k[h_o^2 - h_w^2]}{\ln[R_o/R_w]} \quad \text{Eq. 1}$$

where: Q – Groundwater Flow Rate (cubic meters/day [m^3/d])
- k – Hydraulic conductivity at the Site (m/d)
- h_o – Saturated thickness before drawdown during dewatering (m)
- h_w – Saturated thickness during dewatering (m)
- R_w – Radius of working area (m)
- R_o – R_w + Radius of Influence [R_i] (m)

Hydraulic Conductivities:
Hydraulic conductivities used to estimate the flow rate were taken from the Draft EE/CA (E & E 2010) and will be used to provide a range of flow rates that are anticipated to be observed during dewatering activities at the Site:

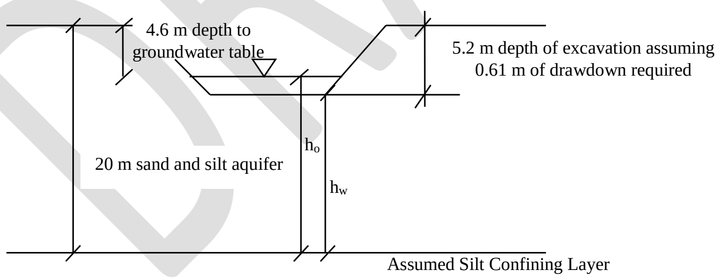
K_{min} = 0.195 m/d or 2.26E-6 (meters/second [m/s])

K_{avg} = 0.725 m/d or 8.39E-6 m/s
K_{max} = 1.570 m/d or 1.82 E-5 m/s

No seasonal conductivity monitoring was performed. These conductivities are based on limited data from a one-time sampling event between the existing wells on Site.

Saturated Thickness:
The saturated thickness (h_o) is defined as the depth from a "confining layer" to the top of the water table. Since no Site information has been obtained on the depth to bedrock or the total depth of the aquifer, this parameter had to be assumed. A literature search was performed to identify any available records of geology for the St. Joe River Valley, but none were available. The only relevant geotechnical reference identified for any location near the Avery Landing Site was a Feasibility Study performed along the St. Maries River at a creosote cleanup site (RETEC 2006). The St. Maries River Creosote Site aquifer consisted mainly of sand and silt with a confining silt layer occurring at approximately 65 feet (20 m) below ground surface. Although this location is not along the St. Joe River, nor near Avery Landing, the St. Maries River is part of the St. Joe River Valley watershed and therefore is deemed to be the best representative information available at this time. Figure 1 shows the saturated thickness values that were used in the calculations for the Avery Site with the assumptions that the groundwater table at the Site occurs at approximately 15 feet below ground surface (4.6 m) and that excavation will extend to 2 feet (0.61 m) below the groundwater table, or to a maximum depth of 17 feet (5.2 m).

Figure 1: Assumed Saturated Thickness



Given the schematic above, the assumed saturated thicknesses are as follows:

h_o = 20 m – 4.6 m = 15.4 m
h_w = 20 m – 5.2 m = 14.8 m

Working Radius and Total Radius:

To calculate the extent of the working area, an open excavation area limit of 0.25 acres (1012 m^2) was assumed, and the working area radius was calculated using the following equation:

$$R_w = \sqrt{(A/\pi)} = 17.9 \text{ m} \quad \text{Eq. 2}$$

To calculate R_o ($R_w + R_i$), the radius of influence was estimated using the assumption that the pumping during dewatering would act similar to that of groundwater withdrawals resulting from an extraction well. The radius of influence is governed by the equation:

$$R_i = Ch\sqrt{k} \quad \text{Eq. 3}$$

where:

C – Unitless constant for radial flow (3000)
h – Drawdown (assumed to be 0.61 m)
k – Hydraulic conductivity (m/s)

The maximum, minimum, and average hydraulic conductivity values presented above that were estimated for the Site were used to calculate the maximum, minimum, and average R_i and ultimately the R_o values that are anticipated to result from the dewatering that will occur during removal activities.

R_i (min) – 2.75 m
R_i (avg) – 5.30 m
R_i (max) – 7.80 m

thus:

R_o (min) – 20.67 m
R_o (avg) – 23.22 m
R_o (max) – 25.72 m

Resulting Flow Rate Range:

Using Equation 1 and the assumptions for the various parameters above, the resulting range of groundwater flow rates that are anticipated due to dewatering include:

Qmin – 77.75 m^3/d or 20,540 gal/day or 14.3 gal/min
Qavg – 159.29 m^3/d or 42,080 gal/day or 29.2 gal/min
Qmax – 247.33 m^3/d or 65,340 gal/day or 45.4 gal/min

A safety factor of 1.5 was used for the system design to ensure that the treatment facility had the capacity to handle additional wastewater streams if these estimates are in fact underestimated due to the many assumptions made.

The design flow rate will be **70 gallons per minute** (1.5*Qmax). Based on this flow rate, the system's influent and effluent tanks will be designed to hold at minimum one days worth of influent wastewater (98,010 gallons) or **100,000 gallons**.

References

RETEC. 2006. FS St. Maries Creosote Site. St. Maries Idaho. July 17, 2006

E & E (Ecology and Environment, Inc.). 2010. Draft EECA Avery Landing Site. December 2010.